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MOTOR-VEHICLE PRODUCTION IN GERMANY
AND OCCUPIED EUROPE

Estimates of total motor-vehicle production, with appendices on individual plants and on production by types in Axis Europe.

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Prepared by
Economic Warfare Division,
United States Embassy,
London, England.

April, 1944.

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MOTOR VEHICLE PRODUCTION IN GERMANY AND OCCUPIED EUROPE.

I. ESTIMATES OF TOTAL PRODUCTION.

This study analyzes motor vehicle production in Germany and German-controlled Europe (not including Italy) from 1940 through 1942. It presents the following information:

1. An estimate of total motor vehicle production in German-controlled Europe in 1942.

2. Descriptions of the models produced by each motor vehicle manufacturer.

3. Annual output, by model, of each motor vehicle manufacturer.

The scope of the study includes passenger cars, trucks, half-tracks, and some special vehicles. The production of light delivery vans, electric road vehicles, tractors primarily for civilian uses and motor-cycles is not covered. Tank and assault-gun chassis production is covered in a paper issued by this office dated January 1, 1944.

For the most part, production estimates have been limited to the years 1940, 1941, and 1942. The nature of the analysis prevents the completion of 1943 estimates until more evidence can be obtained. In a few cases, where early 1943 data showed large increases in output (see Volkswagen light passenger car and Steyr light truck production) an indication of the trend of 1943 production has been given.

A. Production by Type, 1942.

The total motor vehicle output of Germany and German-controlled Europe (not including Italy) was approximately 195,000 units in 1942 (see Table I). Trucks of all sizes account for 76% of this total, passenger cars for 18%, half-tracks for 5%, and special vehicles (armored cars) for 1%. The medium truck production in 1942 was numerically the most important, amounting to 92,500 or 48% of the total.

German Europe Motor Vehicle Production 1942

	Light	Medium	Heavy	Total
Passenger cars	19,100	13,000	3,000	35,100
Trucks	32,400	92,600	23,600	148,600
Half-Tracks	6,300	1,950	1,300	9,550
Armored Cars	1,000	- -	1,000	2,000
			Total	195,250

Of the 195,000 vehicles produced in 1942, approximately 80% were made in Germany, Holland, Belgium and the Protectorate and 20% in France. The French production was concentrated almost entirely on trucks, with the French companies producing 50% of the light trucks, 20% of the medium trucks, and 20% of the heavy trucks. It should be noted, however, that these French vehicles do not conform closely to German specifications.

By 1940 German motor truck production had been brought entirely within the standards set by the 1938 von Schell program with payloads of 1 and 1½ tons for light; 3 tons for medium; and 4½ and 6½ tons for heavy trucks. The same program virtually eliminated the distinction between truck production for military and civilian uses by compelling manufacturers to redesign their purely commercial two-wheel drive models to certain minimum Wehrmacht requirements, making them suitable for military uses. These redesigned models are known as S-types.[1]

Most of the large German firms simultaneously were made to produce four-wheel drive models of their basic types in the 1½, 3 and 4½ ton categories, known as A-types (A for "Allradgetriben" - all-wheel drive) and produced primarily for the Wehrmacht.

A Wehrmacht order issued in January, 1941 (see translation in Appendix A) stated that the 1-ton truck is of no great importance for Wehrmacht purposes. Only one German firm, in fact, has been identified as making this size.

French manufacturers on the other hand were producing two-ton light trucks and 3.5-ton medium trucks as late as 1943. It is safe to assume that at least 90% of the French vehicles were manufactured for German use, but available evidence indicates they were not used by the army for front line transport to the same extent as the more nearly standardized German models.

B. Production by Manufacturer, 1942.

Table II presents the 1942 production total broken down by manufacturer as well as by type of vehicle. Output of those manufacturers with more than one plant is subdivided by plant whenever it is possible to ascribe production of a vehicle type to a specific factory. This has been done for Büssing-N.A.G., Daimler-Benz, and Ford.

There are 30 firms listed in Part I of Table II and these firms make vehicles in roughly 45 plants. Light passenger cars are made by four firms; medium passenger cars, four; heavy cars, two; light trucks, six; medium trucks, twelve; heavy trucks, ten; wheeled armored cars, two; and half-tracks, thirteen.

The most significant fact in Table II is the importance of Ford, Daimler-Benz, and Opel. These three companies together account for over 45% of all vehicle output in Germany, Holland, Belgium, and the Protectorate, and Ford alone accounts for over 40% of the production of medium trucks. The Ford plant at Köln and Opel at Brandenburg are the two biggest plants in the German truck industry accounting for about 40% of all truck output.

C. Trends in Production, 1940 to 1942.

Table III gives vehicle production in Germany, Holland, Belgium, and the Protectorate, classified by type and manufacturer from 1940 to 1942. Where reliable information on 1943 output is available it is also included. A dash (-) marking a maker's output in any one year in this table indicates that no production information is available for the maker in that year. In this case, the nearest year for which an estimate is available has been used in computing total output. For example, 1942 Henschel output of medium trucks is marked with a dash in Table III, and in figuring total 1942 production Henschel was allowed 2,000 medium trucks - the 1941 estimate. The phrase (in production) indicates that while there is definite evidence that a vehicle is being manufactured, satisfactory evidence is lacking of its rate of output.

---

[1] S stands for "Steuerbegünstigt", i.e. enjoying tax reduction. By reducing the tax due on these vehicles from civilian users the German Government encouraged the expansion of the commercial vehicle pool suitable for military requisitioning.

Using the method outlined in the preceding paragraph, Table III indicates that the total 1940 motor vehicle output for Germany, Holland, Belgium, and the Protectorate was approximately 128,000 units. The 1941 total is about 138,500. These figures compare with a 1942 total of 154,000. In other words, Table III indicates a 20% increase in output for motor vehicle manufacturers in these countries from 1940 to 1942. Some of this apparent increase may be the result of carrying over 1941 production figures into 1942 where the 1942 production is not known. This was done in five instances in computing total 1942 production. A net decline in output for these eight models would mean that the total 1942 production estimate was too high. It is not likely, however, that a decline in production of these models could account for more than four or five thousand out of a total increase over two years of 26,000. Consequently, it may be stated that production in Germany, Holland, Belgium, and the Protectorate has risen from 1940 to 1942. All types of vehicles with the exception of medium and heavy passenger cars have shown a definite increase in output over those three years. Previous to 1941 it is quite possible that no expansion in the motor vehicle industry as a whole took place. Transfer of facilities to other types of production did occur and may well have balanced specific plant expansions.

TABLE I.

Motor Vehicle Production by Type, Germany and Occupied Europe, 1942.

	Germany, Holland, Belgium, and the Protectorate		France		Total	
Passenger Cars						
Light	18,100		1,000		19,100	
Medium	13,000		-		13,000	
Heavy	3,000		-		3,000	
		34,100		1,000		35,100
Trucks						
Light	16,500		15,900		32,400	
Medium	73,300		19,300		92,600	
Heavy	18,500		5,100		22,600	
		108,300		40,300		148,600
Half-tracks						
1-ton	4,100		-		4,100	
3-ton	2,200		-		2,200	
5-ton	300		-		300	
8-ton	1,650		-		1,650	
12-ton	950		-		950	
18-ton	350		-		350	
		9,550		-		9,550
Armored cars		2,000				2,000
TOTAL		153,950		41,300		195,250

TABLE II.

Motor Vehicle Production in Germany and Occupied Europe, 1942.

A. Germany, Holland, Belgium and the Protectorate.

Firm	Passenger Cars			Trucks			Half-Tracks						Armored Car	Total Vehicles
	Light	Medium	Heavy	Light	Medium	Heavy	1-ton	3-ton	5-ton	8-ton	12-ton	18-ton		
Adler	—	—	—	—	—	—	900	500	—	—	—	—	—	1,400
Auto Union: Horch	—	2,500	2,000	—	—	—	—	—	—	—	—	—	1,000	5,500
Wanderer	—	8,000	—	—	—	—	—	—	—	—	—	—	—	8,000
B.M.W.	—	1,000	—	—	—	—	—	—	—	—	—	—	—	1,000
Borgward	—	—	—	1,000	7,000	—	—	—	500	—	850	—	—	9,350
Büssing-N.A.G. Braunschweig	—	—	—	—	—	7,500	—	—	—	—	—	—	—	7,500
Berlin	—	—	—	—	—	—	500	—	300	—	—	—	—	800
Leipzig	—	—	—	—	—	—	—	—	—	—	—	—	1,000	1,000
Daimler-Benz:														
Gaggenau and possibly Mannheim	—	—	—	—	8,500	2,000	—	—	—	—	—	—	—	10,500
Untertürkheim	4,600	—	—	3,000	—	—	—	—	—	—	—	—	—	7,600
Marienfelde	—	—	—	—	—	—	—	—	—	—	400	—	—	400
Demag	—	—	—	—	—	—	1,000	—	—	—	—	—	—	1,000

TABLE II (contd.)

Firm	Passenger Cars			Trucks			Half-Tracks						Armored Car	Total Vehicles
	Light	Medium	Heavy	Light	Medium	Heavy	1-ton	3-ton	5-ton	8-ton	12- ton	18-ton		
Famo	—	—	—	—	—	—	—	—	—	—	—	250	—	250
Faun	—	—	—	—	—	1,000	—	—	—	—	—	—	—	1,000
Ford:														
Köln	—	—	—	—	20,000	—	—	—	—	—	—	—	—	20,000
Berlin	—	—	1,000	—	—	—	—	—	—	—	—	—	—	1,000
Amsterdam	—	—	—	—	4,000	—	—	—	—	—	—	—	—	4,000
Antwerp	—	—	—	—	7,000	—	—	—	—	—	—	—	—	7,000
Fross Büssing	—	—	—	—	1,000	—	—	—	—	—	—	—	—	1,000
Gräf und Stift	—	—	—	—	1,000	—	—	—	—	—	—	—	—	1,000
Hanomag	—	—	—	—	—	—	—	700	—	—	—	—	—	700
Henschel	—	—	—	—	2,000	2,000	—	—	—	—	—	—	—	4,000
Klöckner-Humboldt Deutz	—	—	—	—	4,000	—	—	—	—	—	—	—	—	4,000
Krauss-Maffei	—	—	—	—	—	—	—	—	—	600	150	—	—	750
Krupp	—	—	—	2,000	—	—	—	—	—	—	400	—	—	2,400
M.A.N.	—	—	—	—	—	1,000	—	—	—	—	—	—	—	1,000

TABLE II (contd.)

Firm	Passenger Cars			Trucks			Half-Tracks						Armored	Total
	Light	Medium	Heavy	Light	Medium	Heavy	1-ton	3-ton	5-ton	8-ton	12-ton	18-ton	Car	Vehicles
M.W.C.	—	—	—	—	—	—	700	—	—	—	—	—	—	700
Opel	—	—	—	3,500	16,800	—	—	—	—	—	—	—	—	20,300
O.A.F.	—	—	—	—	—	1,000	—	—	—	—	—	—	—	1,000
Phänomen	—	—	—	5,500	—	—	—	—	—	—	—	—	—	5,500
Praga	—	—	—	—	1,000	1,000	—	—	—	—	—	—	—	2,000
Ringhoffer, Tatra	2,000	—	—	—	—	1,000	—	—	—	—	—	—	—	3,000
Saurer	—	—	—	—	—	1,000	1,000	—	—	200	—	—	—	2,200
Skoda	—	—	—	—	1,000	—	—	500	—	—	—	—	—	1,500
Steyr	—	1,500	—	1,500	—	—	—	—	—	—	—	—	—	3,000
Stöwer	2,000	—	—	—	—	—	—	—	—	—	—	—	—	2,000
Vomag	—	—	—	—	—	1,000	—	—	—	—	—	100	—	1,100
Volkswagen	9,500	—	—	—	—	—	—	—	—	—	—	—	—	9,500
Total	18,100	13,000	3,000	16,500	73,300	18,500	4,100	2,200	300	1,650	950	350	2,000	153,950

B. **France**

TABLE II (contd.)

Firm	Passenger Cars			Trucks			Half-Tracks						Armored Car	Total Vehicles
	Light	Medium	Heavy	Light	Medium	Heavy	1-ton	3-ton	5-ton	8-ton	12-ton	18-ton		
Berliet	—	—	—	200	300	900	—	—	—	—	—	—	—	1,400
Citroen	—	—	—	3,000	7,000	—	—	—	--	—	—	—	—	10,000
Ford	—	--	—	—	4,000	400	—	—	—	—	—	—	—	4,400
Peugeot	—	--	—	8,500	—	—	—	—	—	—	—	—	—	8,500
Renault	—	—	—	4,000	7,000	200	—	—	—	—	—	—	—	11,200
Rochet-Schneider	—	—	—	—	—	1,500	—	—	—	—	—	—	—	1,500
Saurer	—	—	—	—	—	1,300	—	—	—	—	—	—	—	1,300
Simca	1,000	—	—	—	—	—	—	—	—	—	—	—	—	1,000
Other	—	—	—	200	1,000	800	—	—	—	—	—	—	—	2,000
Total - **France**	1,000	—	—	15,900	19,300	5,100	--	—	—	—	—	—	—	41,300
TOTAL - GERMANY AND OCCUPIED EUROPE	19,100	13,000	3,000	32,400	92,600	23,600	4,100	2,200	300	1,650	950	350	2,000	195,250

TABLE III.

Motor Vehicle Production by Type and Manufacturer, Germany, Holland, Belgium and the Protectorate, 1940-1943.

Type	1940	1941	1942	1943
Light passenger car				
Daimler-Benz	5,700	5,000	4,600	-
Ringhoffer Tatra	-	-	2,000	-
Stöwer	-	3,000	2,000	-
Volkswagenwerk	1,000	5,000	9,500	7,500 (Jan.June)
Medium passenger car				
Auto Union	10,000	11,000	10,500	(in production)
Borgward	(in production)	-	0	0
B.M.W.	1,000	1,000	1,000	-
Steyr	(in production)	(in production)	1,500	3,500
Heavy Passenger Car				
Auto Union	3,500	2,500	2,000	-
Ford	1,000	1,000	1,000	-
Light Truck				
Borgward	(in production)	1,000	-	-
Daimler-Benz	-	-	3,000	(in production)
Krupp	2,000	2,000	2,000	-
Opel	2,000	3,500	(in production)	-
Phänomen	(in production)	3,500	5,500	(in production)
Steyr	(in production)	(in production)	1,500	3,500
Medium Truck				
Borgward	7,000	7,000	(in production)	-
Daimler-Benz	13,500	10,500	8,500	-
Ford	12,000	22,500	31,000	(in production)
Fross-Büssing	1,000	1,000	1,000	-
Gräf und Stift	1,000	1,000	1,000	-
Henschel	2,000	2,000	-	-
Klöckner-Humboldt	(in production)	4,500	4,000	(in production)
M.A.N.	1,000	-	0	0
Opel	17,500	16,500	16,800	(in production)
Praga	1,000	1,000	1,000	-
Skoda	1,000	1,000	1,000	-
Heavy Truck				
Büssing-N.A.G.	5,500	4,500	6,500	(in production)
Daimler-Benz	-	2,000	(in production)	-
Faun	1,000	1,000	1,000	-
Henschel	2,000	2,000	2,000	-
M.A.N.	1,000	1,000	1,000	-
O.A.F.	-	1,000	1,000	-
Praga	1,000	1,000	1,000	-
Ringhoffer Tatra	1,000	1,000	1,000	-
Saurer	1,000	1,000	1,000	-
Vomag	1,000	1,000	1,000	-
Armored Car				
Auto Union	0	500	1,000	-
Büssing N.A.G.	-	1,000	1,000	-
Saurer	1,000	-	0	0

TABLE III. (continued)

Type	1940	1941	1942	1943
Half Tracks				
1-ton				
Demag	500	1,000	1,000	-
Adler	1,000	1,000	900	-
Büssing N.A.G.	250	300	500	-
Mech. Werke	600	700	700	-
M.N.H.	400	0	0	0
Saurer	100	750	1,000	(in production)
3-ton				
Hanomag	900	600	700	-
Borgward	750	500	500	-
Adler	0	250	500	800
Skoda	-	-	500	-
5-ton				
Büssing N.A.G.	300	300	300	-
Krauss-Maffei	300	600	600	-
Borgward	500	850	850	-
Saurer	-	-	200	-
12-ton				
Daimler-Benz	300	300	400	-
Krupp	200	400	400	-
Krauss-Maffei	50	100	150	-
18-ton				
Famo	100	200	250	-
Vomag	-	100	100	-

II. APPENDIX A.

Annual Production by Manufacturer, for Passenger Cars, Trucks, and Special Vehicles.

I. Classification of Vehicles.

II. Motor Vehicle Manufacture.

(a) Germany, Holland, Belgium and the Protectorate.

1. Auto Union A.G.
2. Bayerische Motorenwerke A.G. (B.M.W.)
3. Borgward
4. Büssing N.A.G.
5. Daimler-Benz
6. Faun Werke G.m.b.H.
7. Ford
8. Fross-Büssing
9. Gräf & Stift Automobilfabrik A.G.
10. Hannoversche Maschinenbau A.G. (Hanomag)
11. Henschel und Sohn
12. Klöckner-Humboldt-Deutz
13. Friedrich Krupp
14. Maschinenfabrik Augsburg-Nürnberg A.G. (M.A.N.)
15. Opel A.G.
16. Österreichische Automobil Fabrik A.G. (O.A.F.)
17. Phänomen Werke
18. Praga
19. Ringhoffer-Tatra Werke A.G.
20. Österreichische Saurer Werke A.G.
21. Skoda Werke
22. Steyr-Daimler-Puch
23. Stöwer
24. Vomag Betrieb A.G.
25. Volkswagen Werke

(b) French Motor Vehicle Production

1. Citroen
2. Ford (Matford)
3. Peugeot
4. Renault
5. Saurer
6. Simca
7. Berliet
8. Rochet-Schneider

I. Classification of Vehicles

1. Kfz. and Sd.Kfz.

Wehrmacht terminology distinguishes between "Kraftfahrzeuge" (abbr: Kfz.) or general-purposes motor vehicles designed and produced not exclusively for military use, and "Sonderkraftfahrzeuge" (abbr: Sd.Kfz.) or special vehicles designed to military specifications and not used outside the Wehrmacht.

The former category includes passenger cars, trucks and certain types of caterpillar and wheel tractors. Vehicles with bodies adapted for different Wehrmacht purposes carry type numbers, e.g. Kfz. 15 = radio truck on medium passenger car chassis.

"Special vehicles" (Sd. Kfz.) include half-tracked tractors and personnel carriers, armored cars, tank chassis, self-propelled gun mountings, etc. They are also numbered by types and functions.

2. Passenger Cars.

Passenger cars used by the Wehrmacht are known as Pkw = Personenkraftwagen. Distinction is made between:

lPkw - light passenger car
mPkw - medium " "
sPkw - heavy " "

Cars adapted for cross-country driving (geländegängig) are further designated by "gl.", e.g. s.gl.Pkw. = heavy cross-country passenger car. According to a German manual, "a simplified light-weight body omitting all non-essential or protruding parts, and a special arrangement of the chassis components, qualify a Pkw for cross-country use."

Although a few German firms continue to manufacture passenger cars of their own design for Wehrmacht use, German production seems to be largely concentrated on the "Standard Chassis" (Einheitsfahrgestell), built by several makers under uniform Wehrmacht specifications. Three types of Standard Chassis (light, medium and heavy) are in production.

3. Trucks.

Trucks (Lkw - Lastkraftwagen) are classified similarly to Pkw: lLkw - light trucks: mLkw - medium: sLkw - heavy.

A circular issued by Oberkommando der Wehrmacht on January 30, 1941, gives the following standard sizes of trucks, by load capacity, manufactured for Wehrmacht use:

"Under the program for the limitation of types in the motor industry, the following load capacity classes have been established for motor trucks:

1, 1½, 3, 4½, 6½ tons load capacity.

The 1-ton truck is of no great significance for Wehrmacht purposes.

In the load classes 1½ - 6½ tons, distinction is made between "S" and "A" types.

"S" types are trucks of classes 1½, 3, 4½ and 6½ tons with rear-wheel drive which are made primarily for commercial use. On the basis of certain Wehrmacht specifications, they are capable of cross-country driving (geländefähig) and therefore enjoy tax reduction (S - Steuer begünstigt).

"A" types are the same trucks but are equipped with an additional front wheel drive (using structural components of the rear axle) and thus are fully suitable for cross-country use (geländegängig). A - Allradgetrieben - 'all-wheel drive').

1½-ton trucks count as "light", 3-ton trucks as "medium" and 4½ and 6½-ton trucks as "heavy"."

The "S" and "A" type symbols referred to in the circular frequently appear in the manufacturer's designations for their models in conjunction with the load capacity in kilograms, e.g. "Daimler-Benz L3000A" = 3-ton all-wheel driven cross-country truck.

In addition, the abbreviation "gl" is sometimes used to indicate fitness for cross-country use - e.g. l.gl.Lkw. The requirements for cross-country trucks are defined as follows:

> "A cross-country truck, owing to the special features of its construction, is capable of driving on the worst dirt roads, crossing sandy and marshy country, and overcoming obstacles, ditches and uneven surfaces.
>
> Suitability for cross-country use requires particular high adaptability to uneven terrain:
>
> Large radius of turn of driving axles (20° - 25°)
> Favorable inclination difference between the driving axles (10° - 15°)
> Sufficient ground clearance (up to 300 mm. according to type of vehicle) on level roadway
> Ground clearance of 200-300 mm. for a vehicle standing on a curvature of 8 m. radius
> Small overhang fore and aft
> Good longitudinal and transverse stability
> Sufficient fording power enabling the vehicle to cross fairly deep water without swamping the carburetor."

4. Armored Cars.

Armored cars (Pz.Sp.Wg. - Panzerspähwagen), armored radio trucks, etc., carry Sd.Kfz. numbers according to type and function.

1. Auto Union A.G.

Chemnitz
Siegmar
Zwickau

The Auto Union complex was the pre-war producer of DKW, Audi, Horch, and Wanderer passenger cars. DKW, Zschopau and Spandau, now appears to be engaged solely in making motorcycles, of which it may be the principal German producer. There is no evidence of wartime production of the Audi car. In Table 1 all Auto Union passenger car production since 1940 has been assigned to either Wanderer, Chemnitz and Siegmar, or Horch, Zwickau. All motors used in the Auto Union medium passenger cars are of the same model and apparently are produced in a single plant, probably Siegmar.

The Wanderer plants have produced two types of medium passenger cars. The largest output has been of the medium Standard Chassis, model 40, a four-wheel drive vehicle of pre-war Wehrmacht design. It is used primarily as a personnel carrier, has a weight of 2,450 kgs. and uses an eight cylinder gasoline engine (model V8/901) of 3.5 liter capacity. The other type of medium passenger car is model W24 a two-wheel drive vehicle of Wanderer pre-war design.

Horch plants also manufacture the medium Standard Chassis as well as three types of heavy Standard Chassis. Model 40, heavy Standard Chassis, is produced in both a two-wheel and four-wheel steering version, and is used for heavy personnel carriers. It has a weight of 2,820 kgs. and uses a 8-cylinder gasoline engine (model V8/108) of 3.8 liter capacity. Model V, also heavy Standard Chassis, is used for several types of light armored car (Sd.Kfz.261 and 222 mounting a 2 cm. gun and machine gun; Sd.Kfz. 221 with anti-tank rifle sPzB41 and machine gun; Sd.Kfz. 223 armored radio car with one machine gun).

Since late 1942 Auto Union, Siegmar, has been making the Steyr-designed 1½-ton truck and medium personnel carrier chassis, model 1500A/02. This type is reported by intelligence sources to have been adopted as the new standard personnel vehicle and light truck for the German army, and it is likely that the model 40 Standard Chassis are no longer in production.

In 1943 Siegmar commenced production of the "East" type caterpillar tractor (Raupenschlepper Ost Type RSO/01). This tractor is also of Steyr design and (according to Manual D/638/1 of 17.12.42) utilizes components of the 1500A/02 truck. It is used as an artillery prime mover and also as tracked cargo carrier. It has a weight of 3,700 kgs. and a useful load of 1,500 kgs. The engine is of 70 HP. Siegmar produced 3,000 vehicles of this type in the early part of 1943, which indicates that this tractor, made also by Steyr-Daimler-Puch, Klöckner-Humboldt-Deutz and Gräf und Stift is of considerable importance in the present German motor vehicle production program.

No information is available as yet on the 1943 activities of the other Auto-Union plants, although Horch production of the model 40 medium Standard Chassis has been identified in early 1943.

AUTO UNION.

Table 1.

Annual Passenger Car Production, by Plant and Model.

Year	Wanderer, Chemnitz and Siegmar				Horch, Zwickau	
	Medium		Medium Standard Chassis		Heavy Standard Chassis	
	4-wheel drive	2-wheel drive	4-wheel drive	4-wheel drive	4-wheel drive	4-wheel drive
	Standard Chassis			Armored Car Sd.Kfz.222	2-wheel steering	4-wheel steering
	Model 40	Model W24	Model 40	Model V	Model 40	Model 40
1940	4,000	3,000	3,000	0	2,000	1,500
1941	5,000	3,000	3,000	500	2,000	500
1942	(in production)	—	2,500	1,000	2,000	0
1943	—	—	(in production)	—	—	0

2. Bayerische Motorenwerke A.G., München (B.M.W.).

München-Oberwiesenfeld
München-Allach
Eisenach
Eisenach-Stockhausen
Spandau
Basdorf

Only the München-Oberwiesenfeld and the old Eisenach plant (former Dixi Werke) are believed to be engaged in motor transport production, the others being principally engaged in manufacturing aero-engines. The heavy commitments of the B.M.W. concern in aero-engine production have reduced its importance in the motor vehicle industry since the outbreak of war, although it has remained a leading producer of medium, heavy and super-heavy motor-cycles, ranking probably second to Auto-Union among German motor-cycle manufacturers.

Before the war and probably up to 1940 B.M.W. (with Stöwer and Hanomag) was assigned the manufacture of the light Standard Chassis passenger car (model 40). This model was probably out of production by 1942, but medium passenger cars made by B.M.W. in 1942 have been identified, and output is estimated to be 1,000 annually.

3. Carl F. W. Borgward (formerly Hansa Lloyd).

Bremen

Borgward is a producer of light and medium trucks and half-tracks. Evidence of medium passenger car production in 1940 has been found, but there is no evidence of passenger car production in later years. A description of three and eight ton half-track output by Borgward is contained in Appendix B.

The Borgward light truck has a one-ton payload and is powered with a four cylinder, 33 horsepower gasoline motor. The medium truck is the standard three-ton vehicle, models B3000S and B3000A, with two and four-wheel drive, respectively. The three-ton truck is equipped with a diesel motor with either 64 or 75 horsepower.

Two types of medium trucks are produced. The only distinction it has been possible to draw between them is that one is equipped with a 3.4 liter motor and the other with a 4.4 liter motor. Presumably the 3.4 liter motor is the 64 horsepower model and the 4.4 liter motor is the 75 horsepower model.

BORGWARD

Table 1.

Annual Motor Vehicle Production, by Models.

Year	Medium Passenger Car	Light Truck 1-ton	Modium Truck Cylinder Capacity 3.4 liters	Modium Truck Cylinder Capacity 4.4 liters
1940	(in production)	(in production)	6,000	1,000
1941	—	1,000	6,000	1,000
1942	—	—	—	(in production)

4. Büssing N.A.G.

Braunschweig
Elbing
Leipzig
Berlin-Oberschöneweide

From 1940 through 1943 Büssing N.A.G. production has been concentrated on heavy trucks along with some production of half-tracks (see Appendix B). The heavy truck has a payload of 4.5 tons and weighs 4,375 kgs. It is produced in two models, 4500A and 4500S, with two- and four-wheel drives respectively. The 4.5-ton truck is equipped with a six cylinder diesel engine with a 7.4 liter cylinder capacity. It is probably produced in the Braunschweig and Elbing plants.

The Büssing plant at Leipzig is probably the sole maker of the heavy eight-wheel armored car chassis[2] using the 150 HP motor model L 8 V/G S 36. The vehicle weighs approximately 8,500 kgs. and has a supplementary steering gear in the rear.

From 1937 through 1939 Büssing N.A.G. had a small output of 1.5-ton cross-country Standard Chassis light trucks, but there is no indication that this production was continued beyond 1939.

Table 1.

Annual Production of Motor Vehicles by Models and Plants.

	Heavy Truck		
Year	2-wheel drive 4500S Braunschweig	4-wheel drive 4500A Braunschweig	Heavy armored car Leipzig
1940	3,000	2,500	-
1941	1,500	3,000	1,000
1942	3,000	3,500	1,000
1943	(in production)	-	-

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[2] Used as

Sd.Kfz. 231	2 cm. gun and MG
Sd.Kfz. 232	armored radio car, one 2 cm. gun and MG
Sd.Kfz. 233	turretless A/C with short 7.5 cm. tank gun
Sd.Kfz. 263	armored command vehicle with fixed turret and overhead frame aerial

There is no evidence of recent production of the 6-wheel armored car chassis, made (according to documents) by Büssing, Magirus-Ulm and Daimler-Benz.

Medium Truck.

Daimler-Benz has produced a 3-ton medium truck since 1935. From 1935 to 1939 medium trucks outside the payload range of the von Schell program were also produced, with carrying capacities of 2.5, 2.75, and 3.3 tons. The following 3-ton truck models have been identified:

LO 3000 - Two wheel drive truck with OM65 diesel engine, in production from 1935 to early 1940.

LG 3000 - Four-wheel drive truck of pre-war design using the more powerful OM67 diesel motor. Production has been identified for 1938 and 1939, and it was probably continued in 1940 when it was replaced by the 3000A model. G appears to stand for "geländegängig" (fully suited for cross-country use).

LGF 3000 - Two-wheel drive truck with an OM65 engine, in production from 1939 to 1941. This model was probably designed under the Schell program. GF means "geländefähig (suited for cross-country use) that is, the equivalent of the S, or two-wheel drive, types.

3000 S - This model appears to be identical with the LGF 3000. The model name was probably changed to conform with the nomenclature of the 1940 standardization program.

3000 A - Four-wheel drive truck introduced under the 1940 standardization program. This model uses the OM65 engine, in contrast to the earlier four-wheel drive model, LG 3000, which was equipped with a more powerful motor.

In addition to the diesel engines mentioned above, an undetermined number of the Daimler-Benz 3-ton and 4.5-ton trucks are equipped with LTC generator engines for use behind the lines.

Heavy Trucks.

Heavy trucks, models L4500S (two-wheel drive) and L4500A (four-wheel drive), with a useful load of 4.5 tons were produced in 1941 and 1942. These trucks use the 112 horse-power diesel engine OM67/4. It is also known that Daimler-Benz produced a 6.5-ton truck, model L6500, in 1941 and 1942, but no dated cases are available. Output may be assumed to be at a lower rate than that of the 4.5-ton truck, and 500 vehicles per annum has been set as an estimate.

5. Daimler-Benz.

Untertürkheim
Gaggenau
Mannheim
Marienfelde

Total Daimler-Benz motor vehicle production in 1942 was approximately 18,000. This is classified by vehicle model in Table 1.

Table 1.

Annual Production by Models.

Year	Light Passenger Car	Light Truck 1.5 tons 2 and 4-wheel drive	Medium Truck		Heavy Truck		
			Medium Truck		4.5 ton		6.5 ton
			2-wheel drive	4-wheel drive	2-wheel drive	4-wheel drive	
1940	5,700	-	10,000	(in production)	-	-	
1941	5,000	-	7,000	3,500	1,000	500	(in production)*
1942	4,600	3,000	5,000	(in production)	(in production)		
1943	-	(in production)	-	-	-	-	-

* Output estimated at 500, see text.

In addition to the models listed in the preceding table, Daimler-Benz has an annual production of 400 half-tracks with 12-ton towing capacity (see Appendix B).

Final assembly of Daimler-Benz vehicles may be assigned to plants as follows:

Light passenger cars - Untertürkheim
Light trucks - Untertürkheim
Medium trucks - Gaggenau and possibly Mannheim
Heavy trucks - Gaggenau and possibly Mannheim
Half-tracks - Marienfelde

Light Passenger Car, Model 170-V.

The 170-V light passenger car (1.7 liter engine) has been in production since 1935 or earlier. The 170-V has been used, by German military classification, as Kfz. 1, Kfz. 2, and Kfz. 2/40; that is, as a light passenger car, signal communications car, radio car and repair car.

Light Truck, Models L1500A and L1500S.

The Daimler-Benz light truck, useful load 1.5 tons, was produced in two models: model L1500A (4-wheel drive) and model L1500S (2-wheel drive). Although the light truck was produced before 1942, sufficient evidence is not available to afford an estimate prior to that year.

6. Faun Werke G.m.b.H.

Nürnberg

This small concern, from documentary evidence, is known to have been making a 4½-ton heavy truck model since the outbreak of war. In 1942 it was also manufacturing one or more road tractor models, and according to intelligence sources, was the sole producer of a diesel-propelled tractor for alternative use on roads or railroads (Schienenlastkraftwagen) designed for service in Russia. Production of the heavy truck is estimated at 1,000 units per annum.

7. Ford

Köln
Berlin-Johannisthal
Amsterdam
Antwerp

The whole German, Dutch and Belgian Ford complex is considered as a unit in this study. The flow of components between these four plants is beyond the scope of this analysis, but ground intelligence indicates that there is some interchange of parts among the four factories. Production has been assigned by plant of final assembly which is not necessarily the only plant that was involved in the production process.

Berlin-Johannisthal produces a heavy passengar car of the Standard Chassis II model, with an eight-cylinder engine. All Ford production in the other three plants from 1940 on has been concentrated on the regular three ton truck with two-wheel drive. Although a four cylinder medium truck, model BB, was produced at Köln before the war, this model was dropped and its production has only been resumed in 1943. Indications from the limited 1943 evidence are that the BB model was as important in 1943 as the eight cylinder model. With the exception of the BB model, all the Ford medium trucks are equipped with eight cylinder, V type engines.

Since late 1942 or early 1943 Ford (probably at Köln) is known to have been making a half-track version of one of its three ton truck models, known as model V3000 S/SSM (Maultier) (Cf. Manual D669/409 issued 15.2.43).

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Köln
Berlin-Johannisthal
Amsterdam
Antwerp

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FORD

Köln, Berlin, Amsterdam and Antwerp

Table 1.

Annual Truck Production, by Model.

Year	Heavy Passenger Standard Chassis II 8-cylinder Berlin	G917TsT IIIa 8-cylinder Köln	G997TsT IIIb 8-cylinder Köln	B198Ts 8-cylinder Köln	BB 4-cylinder Köln	G917T 8-cylinder Amsterdam	B198TsT 8-cylinder Antwerp
1940	1,000	12,000	0	0	0	0	0
1941	1,000	6,000	7,500	2,000	0	7,000	0
1942	1,000	0	0	20,000	0	(in production)	4,000
1943	—	0	0	(in production)	(in production)	—	—

8. Fross-Büssing.

Wien

The only truck model believed to be made by this small Austrian producer is the M.A.N. 3-ton diesel truck manufactured under license. An output of 1,000 has been allowed for 1942.

9. Gräf und Stift Automobilfabrik A.G.

Wien

There is little information on production by this firm up to 1942. A medium diesel truck, probably 3-ton capacity, was advertised in 1942, and has been assumed to be in production in that year at a rate of 1,000 per annum.

Since 1943 Gräf und Stift has been among the manufacturers of the "Raupenschlepper Ost Typ RSO/01" caterpillar tractor, originally produced by Steyr in 1942 (cf. spare parts list dated 16.3.43). Manufacture of wheeled trucks may therefore have been discontinued since 1942.

10. Hannoversche Maschinenbau A.G. (HANOMAG) (formerly Georg Egestorff.)

Hannover-Linden

There is no evidence of truck manufacture in recent years. Before the war and possibly up to 1940 Hanomag was among the producers of the chassis and engine for the standard light passenger car (lPkw. Typ 40).

The 3-ton half-track vehicle (armored model HKL 6p and its predecessors) has been made by Hanomag since before the war.

Several road and agricultural tractor models are known to have been in production in recent years. Some of them are used by the Wehrmacht on a considerable scale, such as the 100 HP heavy wheel tractor model SS100LN. Production of this type in 1942 has been estimated at 800 (Table 1).

Table 1.

Annual Production

Heavy Wheel Tractor, Model SS100LN.

	Production
Up to 1938	850
1939	400
1940	550
1941	800
1942	800

11. Henschel und Sohn.

Kassel

Motor vehicle assembly by Henschel appears to be concentrated at the Mittelfeld plant in Kassel. Table 1 gives output figures for the Henschel medium truck. The medium truck has a useful load of three tons and a weight of 5,700 kgs. It is equipped with a six cylinder engine, either diesel or gasoline, models 33D1 and 33G1.

Table 1 gives output back through 1937.

Catalogues and advertisements show that Henschel also produces 4.5 and 6.5-ton anthracite generator trucks and a 4.5-ton bus, using the Finkbeiner generator system. These heavy generator trucks are not used by the armies in the field and it has not been possible to collect information on them. In view of the size of the Henschel plant, a figure of 2,000 heavy trucks per year has been assigned to cover the generator models.

Table 1.

Annual Production, Medium Truck.

Year	Models 33D1 and 33G1
1937	2,000
1938	3,000
1939	4,000
1940	2,000
1941	2,000

12. Klöckner-Humboldt-Deutz (formerly Magirus)

Ulm-Donau

Klöckner-Humboldt-Deutz is a producer of medium (three-ton) trucks with two- and four-wheel drive, models S330 and A330, respectively. Klöckner trucks are equipped with diesel motors of four models; F4M513, four cylinders, cylinder capacity 4.9 liters: F6M513, six cylinders, cylinder capacity 7.5 liters: F4M516, four cylinders, cylinder capacity 6.1 liters: and F6M516, six cylinders, cylinder capacity 9.1 liters.

Like Opel and Ford, Klöckner, probably since late 1942 or early 1943, has been making a half-track model of his two-wheel drive 3-ton truck, known as model S 3000/SSM (Maultier). (Cf. Manual D 666/407 issued 15.2.43).

Klöckner is also mentioned in an early 1943 manual as producing the Steyr RSO/01 full-tracked artillery prime mover and cargo carrier. Magnitude of this production is not known.

Table 1.

Annual Production - Medium Truck, 2- and 4-wheel drive.

Year	Models A330 and S330
1940	(in production)
1941	4,500
1942	4,000
1943	(in production)

13. Friedrich Krupp

Essen
Bochum
Magdeburg-Buckau

A light 1.5-ton truck has been in production by Krupp since at least 1937. The light truck, model L2H 143, is a cross-country, six-wheel vehicle with four-wheel drive. It has appeared in the sampled cases as army types Kfz.69 (limber truck) and Kfz. 81 (personnel carrier). There is evidence of some pre-war production of medium and heavy trucks by Krupp but it is believed that output of these vehicles had ceased by the beginning of the war or shortly thereafter. There has been a substantial output of heavy (12-ton) half-tracks for the years 1940, 1941 and 1942 (see Appendix B).

Table 1.

Annual Production, Light Truck.

Year	Model L2H 143
1937	2,000
1938	2,000
1939	2,000
1940	2,000
1941	2,000
1942	2,000

14. Maschinenfabrik Augsburg-Nürnberg A.G. (M.A.N.)

Nürnberg
Augsburg

Available information indicates that truck manufacture, by 1942, played only a minor part in the activities of the M.A.N. concern. The M.A.N. 3-ton truck model (also produced under license by Fross- Büssing, Wien) probably went out of production before that year, and manufacture of the 4½-ton type - produced with two-wheel and four-wheel drive - probably did not exceed 1,000 in 1942.

15. Adam Opel A.G.

Brandenburg
Rüsselsheim

The Brandenburg plant, in production since 1937, became the second-largest German truck producer (next to Ford - Köln) and the largest maker of 4-wheel drive 3-ton trucks.

The main product of Brandenburg is the 3-ton "Opel-Blitz" truck with 3.6 liter gasoline engine. The two-wheel drive model 3.6-36-30 has been produced since 1937. In late 1940, the four-wheel drive model 6700 went into production. Output of the two-wheel drive model was reduced in 1941 and 1942.

In late 1942 or early 1943, Brandenburg started making a half-track ("Maultier") version of the 3.6-36-30 model, known as 3.6-36S/SSM. (Cf. Manual D 669/419 issued 1.2.43)

Production of a modified 2-wheel drive chassis with bus body (model 3.6-47) is included in the figures shown below for the 3.6-36-30 model.

Brandenburg, up to 1942, was making a light 1½-ton two-wheel drive truck (model 2.5-32-15). Production of this type during the war period has been at a lower rate than up to 1939.

The parent plant at Rüsselsheim, before the war, produced a considerable range of passenger car models, manufacture of which was discontinued on the outbreak of war. Before the war and up to 1940, Rüsselsheim manufactured the chassis and engine for the military medium standard passenger car. Chassis manufacture was discontinued in 1940, while production of engines (for chassis made by Auto-Union) continued into 1941 and possibly 1942.

In addition, Rüsselsheim, since late 1941 or 1942, has been making the engine (1 liter motor used with Opel's peacetime "Olympia" car) for the tracked motor-cycle (Kl. Kettenkrad, Sd. Kfz. 2) made by N.S.U., Neckarsulm.

The major portion of the Rüsselsheim plant has during the war been devoted to manufacture of aircraft and aero-engine components. Intelligence reports to the effect that the plant resumed motor vehicle production in 1943 have not as yet been confirmed.

16. Österreichische Automobil Fabrik A. G.
(O.A.F)

Wien

This firm (previously Austro-Fiat, later Österreichische Allgemeine Automobil Fabriken), since 1941 or earlier, has been manufacturing the M.A.N. ML4500S two-wheel drive 4½ ton truck under license. There is no record of other vehicles being produced, and output is probably small. Maximum production is estimated to be 1,000 vehicles per year.

17. Phänomen Werke, Gustav Hiller A.G.

Zittau, Sachsen

Phänomen Werke is a producer of light trucks with a useful load of 1.5 tons and weight of 2,700 kgs. for use mainly as ambulances. It has not been possible to distinguish between the two Phänomen models, Granit 25 and Granit 27. Phänomen trucks are also classified as two- and four-wheel drive according to the standard system, 1500S and 1500A.

Table 1.

Annual Production
1½-ton Light Truck, 2 and 4-wheel drive.

Year	Models Granit 25 and 27
1940	(in production)
1941	3,500
1942	5,500
1943	(in production)

18. Praga

(Böhmisch-Mährische Kolben Danek A. G)

Prague-Liben
Prague-Vysocany
Prague-Slany
and others

There is little reliable information on the activities of this large armaments and engineering concern in the motor transport field since the outbreak of war. On the basis of the evidence available, Praga has been credited with an output of 1,000 medium and 1,000 heavy trucks per annum. This firm may be more important in respect of motor vehicles not covered by the report, such as tractors. One of the Praga plants makes the light Pz.Kpfw. 38(t) tank and SP gun chassis.

19. Ringhoffer-Tatra Werke A. G.

Nesseldorf (Koprivnice)
Prague-Smichow
Beraun
Welwarn
Raudnitz

Assembly of motor vehicles probably takes place at the Nesseldorf plant. Products of the firm are known to include a light passenger car (Manual D 662/15 for 1Pkw. 1 lit. Tatra Baureihe 57 K; published 29.10.42) and a three-axle heavy truck. Production of both is probably small and output estimates have been set at 2,000 light passenger cars and 1,000 heavy trucks per year.

20. Osterreichische Saurer Werke A. G.

Wien

Since 1939 Saurer has been making the D7 1-ton half-track (Sd. Kfz. 10) and since 1942, in addtion, the 8-ton KMmll half-track (Sd. Kfz. 7). Manufacture of Maybach-type engines for the former type began in 1942.

A Saurer $4\frac{1}{2}$-ton truck (model 4 BTDVS) was in production in 1942, including a model equipped with an Imbert producer gas generator. Annual output is estimated at 1,000.

Up to 1940 or 1941 Saurer manufactured a wheel-track armored car (RK 7, Sd.Kfz. 254). The considerable increase in Saurer's output of half-track vehicles in 1941 and 1942 may indicate that the firm has not been making armored cars since this type went out of production.

21. Skoda Werke

Pilson

Auto-Skoda Werk

Jungbunzlau-Schlesien (Mlada Boleslaw)

Manufacture of 3-ton half-track vehicles, model HKl 6 (Sd.Kfz. 11) at the Pilson plant has been identified since 1942. However, evidence has been found giving the Jungbunzlau works as assembly plant, possibly indicating that manufacture was transferred to the latter plant later in the year.

No information is available on the trucks manufactured at Jungbunzlau. An output of 1,000 medium trucks per annum has been allowed.

22. Steyr-Daimler-Puch A. G.

Steyr
Wien
Graz
Liebenau
St. Valentin

The Steyr chassis, model 1500 A/02, in production in 1942 and 1943, is used for either light, cross-country trucks (1.5 tons) or medium, cross-country passenger cars. The Steyr chassis has a four-wheel drive and is driven by a 70 horsepower, air-cooled V-8 engine with a 3.5 liter cylinder capacity. There is no reliable information on the plants assembling Steyr motor vehicles.

Since there was no basis for dividing production into light trucks and medium passenger cars, half of the output has been assigned arbitrarily to each. An estimate of 1943 production has been projected on the basis of evidence covering approximately the first five months' production. While the total estimate for 1943 is not supported by the available evidence, it indicates the rough size of the year's production and shows Steyr's position as an increasingly important producer.

The 1500 A/02 model is reported by intelligence sources to have been adopted as a standard Wehrmacht design which is to replace earlier standard personnel carrier and light truck types and to be made under license by several German manufacturers. So far, only Auto-Union, Werk Siegmar, has been definitely identified to have started production of the Steyr model.

In 1942 Steyr commenced manufacture of the "East" type caterpillar tractor (Raupenschlepper Ost Typ RSO/01), designed for use primarily on the Eastern front as prime mover and (with a box body) tracked cargo carrier. This tractor (according to Manual D/638/20 issued 17.12.42) incorporates certain components and the engine of the Steyr 1500A/02 wheeled truck.

The important role played by Steyr designs in the reorganization of German motor vehicles production since 1942 is reflected in the adoption of the RSO/01 tractor by at least three manufacturers in early 1943, namely Auto-Union, Siegmar, Klöckner-Humboldt-Deutz, Ulm and Gräf und Stift, Wien. (Cf. Manual issued 16.3.43).

Steyr is known to have made a wheel-track armored car (Motorkarrette ADMK) up to approximately 1940, but there is no definite evidence of recent manufacture of armored cars by the concern.

Table 1.

Annual Production, Light Trucks and Medium Passenger Cars.

Year	Model 1500 A/02
1942	3,000
1943	7,000

23. Stöwer.

Stettin-Neutorney

The only product of Stöwer is a light passenger car, built with the Standard Chassis model 40. This vehicle weighs 1,680 kgs. and has a two liter cylinder capacity. It is interesting to note that Stöwer was the only manufacturer still making the Standard Chassis light passenger car in 1942.

Table 1.

Annual Production, Light Passenger Car.

Year	Model 40
1941	3,000
1942	2,000

24. Vomag Betriebs A. G.

Plauen
Vogtland

Vomag has been listed as assembly plant for the 18-ton half-track chassis, in addition to Famo, in a spare parts catalog issued in 1941.

Press advertisements indicate that Vomag continues manufacture of heavy trucks, probably 6.5 tons. Also, a 52-seat bus equipped with a producer gas generator was advertised in 1943. An output of 1,000 heavy trucks has been allowed for 1942.

25. Volkswagen Werke.

Fallersleben

Production of the Volkswagen, or "German jeep" model 82, was begun in 1940. Output has risen rapidly from 1,000 in 1940 to 7,500 in the first half of 1943. This is the largest increase in production that has been determined for any German firm. The Volkswagen has a weight of 685 kgs. and a useful load of 450 kgs. It is equipped with a four cylinder gasoline engine with a 1.1 liter cylinder capacity.

An amphibious model of the Volkswagen (probably lPkw K2s Typ 166, Manual D 662/13 issued 5.12.42) went into production in 1942. No evidence is available on this model to date, and it is not known whether its production is covered by the annual output figures given in Table 1.

Ground intelligence suggests the possibility that the amphibious model is made not at the Fallersleben plant but at the former Bugatti works at Molsheim, Alsace.

Table 1.

Annual Production, Light Passenger Car.

Year	Model 82
1940	1,000
1941	5,000
1942	9,500
Jan.-June 1943	7,500

French Motor Vehicle Production.

Quarterly production schedules for the principal French producers are available through ground intelligence for nearly every quarter-year in 1941, 1942, and 1943. The Ministry of Economic Warfare reports that these production schedules check closely with reports of actual production and of deliveries of vehicles to the German authorities. These production schedules have been made the main basis for the estimates of French motor vehicle output.

1. Citroen.

Citroen production schedules are as follows:

1941	- 5,800
1942	- 10,000
1943	- 5,300

1941 production was approximately 10 percent passenger cars, 35 percent light trucks and 55 percent medium trucks. 1942 production was approximately 30 percent light trucks (two tons) and 70 percent medium trucks (3.5 tons). 1943 production appears to have been almost entirely 3.5 ton trucks.

The Citroen light truck in production in 1942, model PUD 7, has a useful load of two tons, weighs 2.1 tons, and has a cylinder capacity of 1.9 liters. The 1942 medium truck, model P38L, has a useful load of 3.5 tons, a weight of 3.9 tons, and a cylinder capacity of 4.6 liters.

2. Ford (Matford).

French Ford production schedules are as follows:

1941	- 1,800
1942	- 4,400
1943	- 3,600

Approximately 90 percent of Ford output has been three-ton trucks and the remainder has been five-ton trucks. M.E.W. report, 20.1.44, indicates that Matford is also active as a supplier of parts for the Ford complex in Germany, Holland and Belgium.

3. Peugeot.

Scheduled Peugeot production was as follows:

1941	- 4,400
1942	- 8,500
1943	- 4,500

All of these vehicles were light models. A report on the production program for one quarter in 1941 lists a few passenger cars and a variety of truck sizes ranging from 500 kgs. to two tons. Later intelligence reports on planned production list only the two-ton light truck.

There are numerous reports of Peugeot's producing components for German vehicle manufacturers but it is beyond the scope of this paper to analyze this phase of its activity.

4. Renault.

The scheduled production for Renault is the largest for any French company:

1941	- 7,000
1942	- 11,200
1943	- 9,600

Output includes light, medium and heavy trucks. The schedules for 1942 called for about 35 percent light trucks, 60 percent medium and the remainder heavy.

5. Saurer.

Although the production schedules for 1941 allot a small production of light and medium trucks to Saurer, this company is primarily a producer of heavy trucks, and production programs for 1942 and 1943 are concerned exclusively with the 4.5 ton or five ton truck. Production in 1942 was concentrated on truck model 3 CT 1, useful load five tons, cylinder capacity eight liters. Saurer production schedules are as follows:

1941 - 450
1942 - 1,300
1943 - 600

6. Simca.

Simca production plans were not covered in the production schedules used to estimate output of other French makes. However, a monthly table of deliveries to the Germans from the last quarter of 1942 through the first half of 1943 indicates that production is approximately 1,000 units per annum. Evidence indicates that Simca's only product is a light passenger car (Fiat-Balilla type).

7. Berliet. Lyons

Berliet production has been identified for light, medium and heavy trucks and one unidentified model (PCKB 3 G). The light truck, model VIRF has a useful load of 800 kgs. It has a four cylinder, 11 horsepower, gasoline engine with a two liter cylinder capacity. Two models of medium trucks are produced: model GDMG with either a 10 or 29 horsepower motor and model VDCAG. Model VDCAG has a useful load of 2.7 tons. The VDCAG engine is a four cylinder, 15 horsepower gasoline engine with a 4.1 liter cylinder capacity. The Berliet heavy truck is model GDRAG and has a 19 horsepower engine.

8. Rochet-Schneider. Lyons

Table 1.

Annual Production, 5-ton Truck.

Year	Models 420G110 and 105
1940	500
1941	1,500

BERLIET.

Table 1.

Annual Production by Models.

Year	Light Truck Model VIRF 11 HP	Medium Truck Model VDCAG 15 HP	Medium Truck Model GDMG 10 and 29 HP	Heavy Truck Model GDRAG 19 HP	Unidentified Model PCKB 3 G
Sept-Dec. 1940	-	700	-	300	-
1941	200	1,400	200	900	100
1942	200	-	(in production)	900	-

APPENDIX B.

Half-Track, Annual Production By Type.

I. Classification of Half-Tracks

II. Half-Track Manufacture.

1. 1-ton Half-Track
2. 3-ton Half-Track
3. 5-ton Half-Track
4. 8-ton Half-Track
5. 12-ton Half-Track
6. 18-ton Half-Track

I. Classification of Half-Tracks.

Half-tracked Prime Movers.

Half-tracked prime movers are known as Zgkw (Zugkraftwagen) and are classified by towing capacity (Zgkw 1 t, 3 t, 5 t, 8 t, 12 t and 18 t.

The 1-ton and 3-ton types count as light tractors (1 Zgkw), 5 and 8-ton as medium (mZgkw), 12 and 18-ton as heavy (sZgkw).

In addition, Zgkw are given Sd.Kfz. type numbers, which differ according to special uses - e.g. 1ZGkw 1t is known as SD.Kfz. 10 in its standard form, but as Sd. Kfz. 250 for the armored model.

1. 1-ton Half-Track Type D7 and D7p (armored model) Sd.Kfz. 10: Sd.Kfz. 250 (armored)

Five plants were engaged on assembly of this type in 1942. Two further plants discontinued production in 1940, one of them, M.I.A.G.-Braunschweig, presumably because of its increasing production of Pz.Kpfw. III tanks.

Only two assembly plants (Adler and Saurer) are also making engines for the D7 vehicle (Maybach model HLTRKM) since 1942. The other assembly plants install engines made by Maybach, Friedrichshafen and Nordbau, Berlin-Niederschöneweide. An independent estimate of engine production, which also serves as a check on the chassis production estimates, is presented in Tables 1 and 2.

The D7 and D7p models were preceded by the D6 model, probably before 1938. The D6 was produced by Demag, Adler and Mechanische Werke Kottbus.

Table 1.

1-ton Half-Track Type D7 and D7p (armored model)

Annual Production by Manufacturer

Year	Demag Wetter/Ruhr	Adler Frankfurt	Büssing Berlin-Oberschöneweide	Mechanische Werke Kottbus	M.I.A.G. Braunschweig	M.N.H. Hannover-Wülfel	Saurer Wien	Total
1938	(150))	200	(150))	(200))	(200))	(225))	(0))	1,125
1939	(200))850	500	(200)) 600	(400))1,200	(200)) 400	(300)) 925	(50))150	1,850
1940	(500))	1,000	(250))	(600))	(0))	(400))	(100))	2,850
1941	1,000*	1,000*	50) 300 250*)	700	0	0	750	3,750
1942	1,000*	900*	100) 500 400*)	700	0	0	1,000	4,100

* Armored model D7p.

Figures in parentheses are estimated allocations of firm figures covering several years' output.

Table 2.

Maybach ML 42 TRKM Engines (100 HP) for 1-ton Half-Track.

Annual Production by Manufacturer.

Year	Maybach Friedrichshafen	Nordbau Berlin	Adler Frankfurt	Saurer Wien	Total	Chassis Production Estimate
1938/39	2,000	300	0	0	2,300	2,975*
1940	2,500	300	0	0	2,800	2,850
1941	3,000	900	0	0	3,900	3,750
1942	1,800	1,500	600	500	4,400	4,100

* Early models of the D7 half-track were equipped with engines model NL 38 TRK (90 HP) on which no evidence is available.

2. 3-ton Half-Track Type HKl 6 (Sd. Kfz. 11) and armored model HKl 6p.

The HKl 6 and HKl 6p are of Hanomag design and superseded the earlier models HLKl 5 (Hansa Lloyd) and HLKl 6 which were out of production by 1940 or earlier. The same presumably applies to the Hanomag H8H 3-ton track.

The HKl 6 model uses Maybach engines, model HL 42 TUKRM (100 HP). Model HL 42 TUKRRM is used with HKL 6p.

The vehicle was originally made by Hanomag and Borgward (formerly Hansa-Lloyd) only. Adler, Frankfurt and Skoda, Pilsen and/or Jungbunzlau (Mlada Boleslaw) started manufacture in 1941 and 1942 respectively. A further plant, Maschinenfabrik Niedersachsen, Hannover, is listed as chassis manufacturer in early spare parts lists but apparently did not go into production.

Table 1.

3-ton Half-Track Type HKL 6 and Armored Model HKL 6 p.

Annual Production, by Manufacturer.

Year	Hanomag Hannover	Borgward Bremen	Adler Frankfurt/Main	Skoda	Total
1940	300) 600*) 900	750 (including 1939)	0	0	1,650
1941	600*	500	250	0	1,350
1942	700*	500	500	500	2,200
1943	-	-	800**	-	

* Armored Model HKl 6p.
** Based on January-May production

Estimated Production of HL 42 TUKRM Motor for 3-ton Half-Track.

No full estimate is possible for years prior to 1942, except for Nordbau. This is due to the use of several engine models on earlier types, presumably made chiefly by Maybach.

1942 production was distributed approximately as follows:-

Table 2.

HL 42 TUKRM Motor for 3-ton Half-Track.

1942 Production by Manufacturer

Year	Maybach Friedrichshafen	Nordbau Berlin	Adler Frankfurt	Total	Chassis Production
1942	900	1,500	300	2,700	2,200

3. 5-ton Half-Track Type BN-9.

Sd.Kfz. 6 - mZgkw5to.

The 5-ton half track is at present made only by Büssing N.A.G., Berlin-Oberschöneweide. Earlier models were also made by Krauss Maffei (KML 4 1934) and by Daimler-Benz, Marienfelde (DBL 5, DBL 8) up to 1939. Büssing N.A.G. previously made models BNL 4, BNL 5 (1935), BNL 7 and BNL 8.

Table 1.

5-ton Half-Track Type BN-9.

Annual Production, by Manufacturer
(including earlier models)

Year	Büssing N.A.G. Berlin-Oberschöneweide	Daimler-Benz Marienfelde
1937/38	500	400
1939	200	
1940	300	0
1941	300	0
1942	300	0

4. 8-ton Half-Track KMm11.
mZgkw 810 - Sd. Kfz. 7

Plants engaged in the manufacture of the KMm11 type are shown below. Krauss-Maffei (München) previously made the earlier models KMm8, KMm9, KMm10 and Borgward (then Hansa-Lloyd) made models HLm10 and HLm11. Daimler-Benz manufactured a 1934 model of its own, DBm8 in 1934, but did not make any later models.

The KMm11 model used Maybach HL 62 TUK engines rated at 140 metric HP.

Table 1.

8-ton Half-Track KMm11.

Annual Production, by Manufacturer.

Year	Krauss-Maffei München	Borgward Bremen	Saurer Wien	Total
Up to 1937	-	1,400	0	0
1938	300		0	2,400
1939	400		0	
1940	300		0	
1941	600	850	0	1,450
1942	600	850	200	1,650

Engines for 8-ton Half-Track.

The HL 62 TUK engine used with the 8-ton half-track is now made by Nordbau and Krauss-Maffei only. Maybach ceased production of this model in 1940 or 1941. Production has been as follows:-

Table 2.

Engines for 8-ton Half-Track.

Annual Production, by Manufacturer.

Year	Maybach Friedrichshafen	Nordbau Berlin	Krauss-Maffei München	Total	Chassis Production Estimates
1937	400*	200	0	1,000	2,400
1938		400	0		
1939	500	600	0	2,100	
1940		700	300		
1941	250	1,100	600	1,950	1,450
1942	0	1,500	600	2,100	1,650

* Earlier models HL 52 TU and HL 57 TU.

5. 12-ton Half-Track DB 10.
sZgkw12to - Sd. Kfz. 8

The 12-ton half-track DB 10 in 1942 was made by Daimler-Benz (Marienfelde), Krupp (Essen) and Krauss-Maffei (München). Earlier models DBs7, DBs8 and DB 9) were made by Daimler-Benz only.

The engine used is Maybach HL 85 TUKRM, rated at 185 HP. Earlier models used Maybach SD08 (150 HP).

Table 1.

12-ton Half-Track DB 10

Annual Production by Manufacturer.

Year	Daimler-Benz Marienfelde	Krupp Essen	Krauss-Maffei München	Total
1939	200	0	0	200
1940	300	200	50	550
1941	300	400	100	800
1942	400	400	150	950

Maybach, Friedrichshafen, is sole producer of the HL 85 TUKRM engine. Production has been as follows:

Table 2.

Annual Production by Maybach, Friedrichshafen.
(sole producer)

Year	Output
Up to 1940	600
1941	900
1942	1,100

6. 18-ton Half-Track F3
sZgkw 18to - Sd. Kfz. 9

Famo G.m.b.H., Breslau, is probably the only maker of the 18-ton half-track. Vomag, Plauen, has been listed as chassis manufacturer in spare parts lists, but all evidence indicates that Vomag's production, if any, is small. An allowance of 100 vehicles per annum has been made for Vomag in the table below.

Table 1.

18-ton half-track F3

Annual Chassis and Motor Production, by Manufacturers.

Year	Famo Breslau	Vomag Plauen	Nordbau Berlin
1938/39	350	0	450
1940	100	0	
1941	200	(100)	250
1942	250	(100)	300